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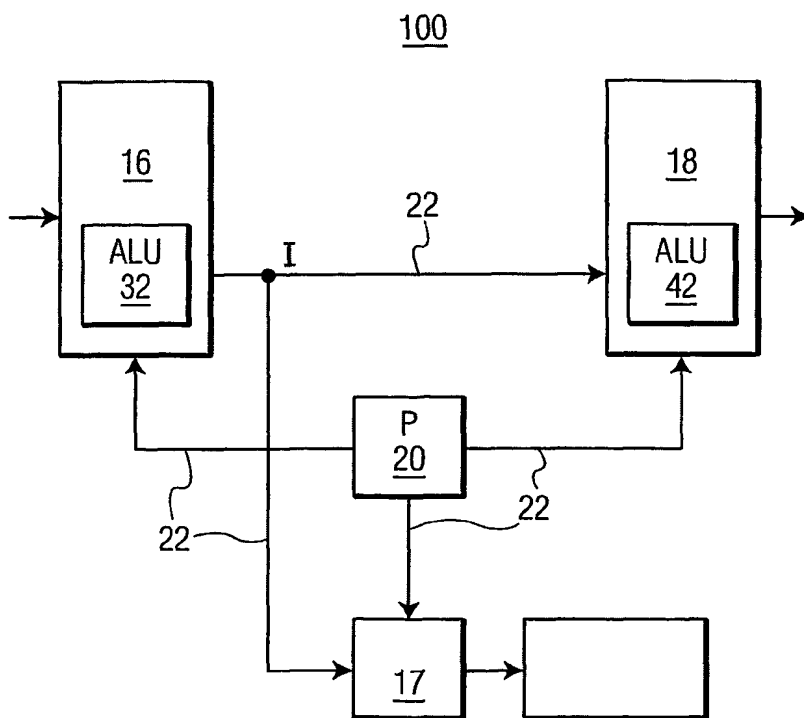
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(54) Title: SYSTEM AND METHOD OF RELIABLE FORWARD SECRET KEY SHARING WITH PHYSICAL RANDOM FUNCTIONS



(57) Abstract: A secure solution is provided to the problem of secret key agreement. In particular, a method of reliable forward secret key sharing is disclosed between two legitimate correspondents whose profiles match sufficiently. The invention relies on a physical random function, sometimes referred to as a physical unclonable function (PUF) to provide a secure solution to the problem of secret key agreement. In one embodiment, a one-pass protocol is introduced based on Reed-Solomon codes leading to an unconditionally secure solution. In a further embodiment, the solution of the first embodiment is improved upon by providing a conditionally secure solution based on a pseudo random family of functions. In a still further embodiment, a two-pass protocol is introduced which is used exclusively for purposes of identification and authentication. In accordance with the principles of the two-pass protocol, two communications are required and unlike the one-pass protocol, the second correspondent selects the secret key K.

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- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ,*

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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

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